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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/620,361

07/17/2003

Hiroshi Sumi

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05/12/2006

SUGHRUE MION, PLLC  
2100 PENNSYLVANIA AVENUE, N.W.  
SUITE 800  
WASHINGTON, DC 20037

EXAMINER

NORRIS, JEREMY C

ART UNIT

PAPER NUMBER

2841

DATE MAILED: 05/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/620,361

Applicant(s)

SUMI ET AL.

Examiner

Jeremy C. Norris

Art Unit

2841

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) 10 and 11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Art Unit: 2841

Claims 1, 2, and 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,217,989 (Brody) in view of JP 2000-67646 (Matsushita) and US 5,928,804 (Leddy).

Brody discloses, referring to figures 1-2, a wiring board comprising: a conductor layer (24) comprising Fe and Cu; and at least one of a radiator, a connection terminal, a cover and a circuit component (27), connected to the conductor layer through a joining member (20) which is obtained by coating a copper paste (see col. 1, lines 10-30) and simultaneously firing the ceramic green sheet and coated copper paste (see col. 1, lines 25-50). Brody does not specifically state that the copper paste comprises a copper powder, an organic vehicle and an  $\text{Fe}_2\text{O}_3$  particle [claim 1]. However, Matsushita discloses a copper paste comprising a copper powder ([0024]), an organic vehicle ([0016]) and an iron oxide particle ([0044]). Matsushita does not specifically state that the iron oxide is  $\text{Fe}_2\text{O}_3$ . However, it is well known to use  $\text{Fe}_2\text{O}_3$  as a particle for forming a conductor as evidenced by Leddy (col. 19, lines 30-50). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to choose  $\text{Fe}_2\text{O}_3$  as the iron oxide in the invention of Matsushita as is known in the art and evidenced by Leddy. The motivation for doing so would have been to use a known material suitable for conductor applications. Moreover, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416. Moreover, it would have been obvious to one having ordinary skill in the art at the time of invention to use the modified paste of Matsushita in the invention of Brody. The

Art Unit: 2841

motivation for doing so would have been to form a conductor with consistent resistance even under high temperatures (Matsushita [0008]).

Additionally, the modified invention of Brody teaches, that a surface of the conductor layer is subjected to a plating treatment (see col. 1, lines 35-40) [claim 2], wherein the copper paste comprises more than 20 parts by mass of the organic vehicle per 100 parts by mass of the copper powder (see col. 4, lines 10-25) [claim 4], wherein the copper paste comprises a ceramic particle (see col. 2, lines 55-60) having an average particle size of 100 nm or less (see col. 3, lines 45-60) [claim 5].

Regarding claim 6, the method steps recited in the claim are process limitations within a device claim and thus are considered only to the extent to which said limitations impact the structure of the device. As such, since the modified invention of Brody teaches a wiring board according to claim 1 as described above, and claim 6 provides no further structural differences, the structure of claim 6 is rendered obvious. Moreover, it is well settled that even though product by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product by process claim is the same as or obvious from a product of the prior art, the claims unpatentable even though the prior product was mad by a different process. *In re Thorpe*, 77 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir 1985). Additionally the Examiner notes that the modified invention of Brody teaches sintering in a nitrogen atmosphere at a peak temperature in the range of 850-1050° C (see col. 4, lines 45-60).

Art Unit: 2841

Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2000-67646 (Matsushita) in view of US 5,928,804 (Leddy).

Matsushita discloses a copper paste comprising a copper powder ([0024]), an organic vehicle ([0016]) and an iron oxide particle ([0044]). Matsushita does not specifically state that the iron oxide is  $\text{Fe}_2\text{O}_3$  [claim 7]. However, it is well known to use  $\text{Fe}_2\text{O}_3$  as a particle for forming a conductor as evidenced by Leddy (col. 19, lines 30-50). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to choose  $\text{Fe}_2\text{O}_3$  as the iron oxide in the invention of Matsushita as is known in the art and evidenced by Leddy. The motivation for doing so would have been to use a known material suitable for conductor applications. Moreover, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Additionally, the modified invention of Matsushita teaches, wherein the copper paste comprises more than 20 parts by mass of the organic vehicle per 100 parts by mass of the copper powder (see table 1, [0046]-[0047]) [claim 8].

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsushita in view of Leddy as applied to claim 7 above, and further in view of US 6,919,124 B2 (Ito).

The modified invention of Matsushita teaches the claimed invention as described above except the modified invention of Matsushita does not specifically teach a ceramic

Art Unit: 2841

particle having an average particle size of 100 nm or less [claim 9]. However, Ito teaches adding ceramic particles having an average size of 100  $\mu\text{m}$  to a conductive paste (col. 7, lines 5-20). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to add ceramic particles of this size to the once-modified invention of Matsushita as taught by Ito. The motivation for doing so would have been to enhance thermal conductivity.

### ***Allowable Subject Matter***

Claims 10 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Claims 10 and 11 state the limitation "wherein said  $\text{Fe}_2\text{O}_3$  particle has an average particle size of 1  $\mu\text{m}$  or less". This limitation, in conjunction with the other claimed features, was neither found to be disclosed in nor suggested by the prior art. Indeed, the prior art of Matsushita teaches that such a small size is ineffective for the device ([0010]). Therefore the ordinarily skilled artisan would not be motivated to make such a size modification.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1, 2, and 3-9 have been considered but are moot in view of the new ground(s) of rejection.

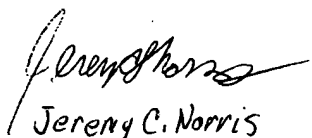
**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy C. Norris whose telephone number is 571-272-1932. The examiner can normally be reached on Monday - Friday, 9:30 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on 571-272-1957. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JCSN

  
Jeremy C. Norris  
Patent Examiner  
Technology Center 2800